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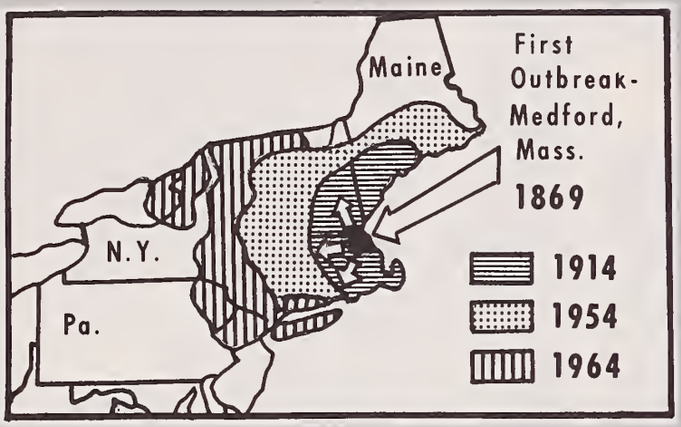
ARMING AGAINST THE GYPSY MOTH

USDA scientists are developing new weapons to fight an old enemy—the gypsy moth. This serious pest of forest, shade, and fruit trees infests 40 million acres of timber from Maine to Pennsylvania.

A scientist at the Gypsy Moth Methods Improvement Laboratory, Cape Cod, Mass., prepares a chemical compound which will be tested for its value in sterilizing male gypsy moths. A female gypsy moth (right), lays her eggs on the bark of a tree limb. Soon after she has finished, she will die. Female gypsy moths are unable to fly. BN–25379; BN–25394



A History of Destructi

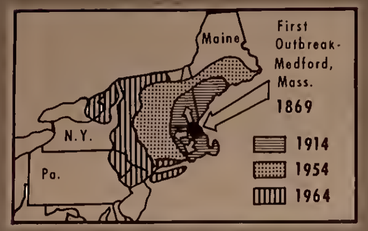
"The street was black with them . . . so thick on the trees they were stuck together like cold macaroni . . . the huge, hairy caterpillars were constantly dropping upon people on the sidewalks . . . the foliage was stripped from all the trees in the eastern part of our town . . ."

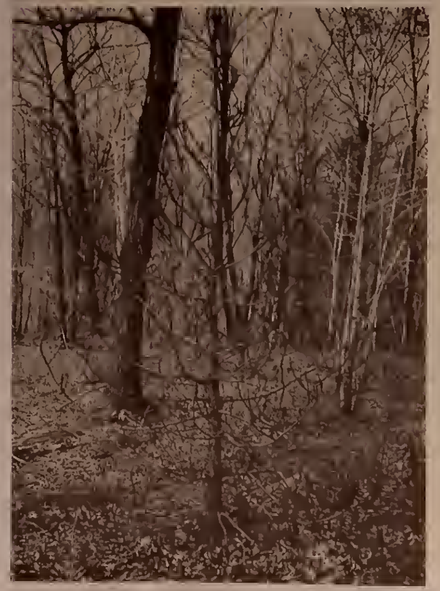
This was Medford, Mass., in the 1880s, as described by its townspeople. The villain was the gypsy moth, which had been brought to Medford from Europe in 1869 by a naturalist who attempted to cross the gypsy moth with the silkworm moth. Some of his gypsy moth caterpillars escaped, and in less than two decades the insects were stripping the leaves from trees in Massachusetts in a massive swath of destruction. The infestation spread, despite costly control efforts, and now threatens the important hardwood timber resources in the eastern half of the United States.

The gypsy moth has four stages in its life cycle—egg, larva (caterpillar), pupa, and adult (moth). Female moths deposit their eggs during midsummer on tree trunks and on shrubs, rocks,

Above, Caterpillars of the gypsy moth feed on an oak leaf. The map shows the spread of the moths. A large number of caterpillars will quickly strip a forest. The autumn-like scene (lower left) occurred during midsummer in a Connecticut woodland in the wake of the ravenous caterpillars. BN–15039; BN–25778; N–57758

Right, Gypsy moth pupae, which have been gathered in nearby infested areas, are sorted into three catagories: normal, virus infected, and parasite infected. The normal ones are used in rearing moths for laboratory experimentation. The others are used in producing virus extracts and rearing parasites. BN–25374





A History of Destruction . . .

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The gypsy moth has four stages in its life cycle—egg, larva (caterpillar), pupa, and adult (moth). Female moths deposit their eggs during midsummer on tree trunks and on shrubs, rocks, lumber, or other objects near trees. When the eggs hatch the following spring, the young caterpillars begin feeding voraciously, devouring leaves on the trees in their vicinity and moving on to new trees as the leaf supply is depleted. A single complete defoliation by the caterpillars may kill such trees as pine and hemlock, and two successive defoliations will usually kill hardwood trees.

Today, as in the past, control programs depend primarily on insecticides. However, scientists of the Plant Pest Control Division of USDA's Agricultural Research Service are testing several new methods of fighting the moth. This is a part of the Department's extensive research to find pest control methods that do not require conventional pesticides. Much of the work on the moth is centered at the Gypsy Moth Methods Improvement Laboratory at Cape Cod, Mass. The more promising methods under test include the use of chemicals to sterlize male moths, an attractant to lure male moths into traps or to a chemosterilant, a virus disease, and parasites and predators of the gypsy moth. Eradication from the United States is the goal of the scientists.

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Right, Gypsy moth pupae, which have been gathered in nearby infested areas, are sorted into three catagories: normal, virus infected, and parasite infected. The normal ones are used in rearing moths for laboratory experimentation. The others are used in producing virus extracts and rearing parasites. BN–25374

Parasites, Predators, a Virus and "Confusion" . . .

Scientists have been working for years on the introduction of natural enemies of the gypsy moth—diseases, parasites, and predators. Two species of parasites—a fly and a wasp—have been shipped from Spain and are being field tested. Care must be taken so that any natural enemy brought to this country would not become a pest itself.

A disease that occurs naturally among gypsy moth caterpillars and works consistently in the laboratory is the wilt disease, caused by a polyhedral virus. Ways to mass produce the virus are being studied in the hope that the disease can be introduced in the field on a large scale.

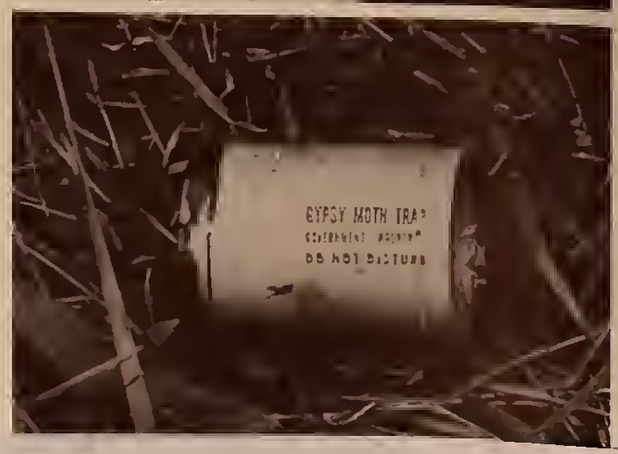
Sterilization of male gypsy moths as a control measure seems promising to the scientists and tests are being made with several sterilizing chemicals. When a sterile male mates with a female, her eggs will not hatch.

A synthetic attractant, gyplure, is being used to lure male moths to traps and to chemosterilants. Gyplure is also being used in a study of a unique method called the "confusion" technique. An area is saturated with the synthetic attractant in the hope of confusing the male moths to the extent that they would not be able to find and mate with the females.

Above, a scientist examines a bottle containing the polyhedral virus responsible for wilt disease in gypsy moths. While deadly to the gypsy moth, the virus does not harm any other living things. It is concentrated in the light ring near the bottom of the container. The scientists are searching for ways to develop large-scale buildups of gypsy moth wilt disease in the field. Right, —a scientist opens a valve in a hose, permitting a synthetic attractant, gyplure, to circulate through a container of gypsy moths in a test of the confusion technique BN–25373; BN–25384

Trap Drop . . .

Gypsy moth traps, long in use as a survey tool to determine the location of infestations, are now being air-dropped in many infested areas as a control measure. The traps are small cardboard cylinders coated on the inside with a sticky substance. A small amount of gyplure on a wad of cotton is placed inside the trap as a lure. A device inside the airplane releases the traps at a predetermined rate.



A small tuft of cotton moistened with gyplure is placed inside a gypsy moth trap (above). The traps are loaded into airplanes (upper right), and dropped over infested areas in predetermined numbers and patterns through a special chute in the airplane (right). The traps fall to the ground (lower right), where the gyplure attracts the male moths. Once inside the trap, the moths become entangled in a sticky substance and are unable to leave. BN–25520; BN–25166; BN–22832; BN–22818

A typical trap, picked up in the field, contains a host of captured gypsy moths. BN–25518

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